KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

1st PRE-BOARD EXAMINATION 2020-21

CLASS: XII   SUB: INFORMATICS PRACTICES NEW (Python) (065)

Max Marks: 70   **TIME: 03 hrs.**

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.

2. Both Part A and Part B have choices.

3. Part-A has 2 sections:

    a. Section – I is short answer questions, to be answered in one word or one line.

    b. Section – II has two case studies questions. Each case study has 4 case-based sub- parts. An examinee is to attempt any 4 out of the 5 subparts.

4. Part - B is Descriptive Paper.

5. Part- B has three sections

    a. Section-I is short answer questions of 2 marks each in which two questions have internal options.

    b. Section-II is long answer questions of 3 marks each in which two questions have internal options.

    c. Section-III is very long answer questions of 5 marks each in which one question has question has internal option.

	Part - A	
	Section - I **Attempt any 15 questions from questions 1 to 21**	
1.	Find the output of following program. import numpy as np x= [1, 2, 3, 99, 99, 3, 2, 1] x1, x2, x3 = np.split(x, [3,5]) print(x1, x2, x3)	1
2.	Consider the matrix of 5 observations each of 3 variables X0,X1,X2 whose observed values are held in the three rows of the array X: X = np.array([[0.1, 0.3, 0.4, 0.8, 0.9], [3.2, 2.4, 2.4, 0.1, 5.5], [10., 8.2, 4.3, 2.6, 0.9]]) Write the python statement to print the covariance of X and state that what does the diagonal element of the resultant matrix depicts.	1
3.	The statement in SQL which allows to change the definition of a table is (A) Alter (B) Update	1

	(C) Create (D) select	
4.	Fill in the blank with appropriate numpy method to calculate and print the variance of an array. import numpy as np data=np.array([1,2,3,4,5,6]) print(np.___(data,ddof=0)	1
5.	How would you create the identity matrix in python? (a) np.eye(3) (b) identity(3,2) (c) np.array([1, 0, 0], [0, 1, 0], [0, 0, 1]) (d) All of these	1

6.	Using Python Matplotlib can be used to count how many values fall into each interval.
	    a) line plot
	    b) bar graph
	    c) histogram
		1

7.	Bluetooth is an example of _____.
	  a. Local Area Network b. Virtual and private Network
	  c. Personal Area Network d. Wide Area Network
		1

8.	A dataframe fdf stores data about passengers, flights and years. First few rows of dataframe are shown below. <table><tr><td></td><td>Year</td><td>Month</td><td>Passenger</td></tr><tr><td>0</td><td>2009</td><td>January</td><td>112</td></tr><tr><td>1</td><td>2009</td><td>February</td><td>118</td></tr><tr><td>2</td><td>2009</td><td>March</td><td>132</td></tr><tr><td>3</td><td>2009</td><td>April</td><td>129</td></tr><tr><td>4</td><td>2009</td><td>May</td><td>121</td></tr></table> Using above dataframe, write command for compute total Passenger per year.	1
9.	Which network topology is requires a central controller or hub : a. Bus b. Star c. Ring d. Mesh	1
10.	Rajani has stolen a credit card. She used that credit card to purchase a laptop. What type of offence has she committed?	1
11.	What will be the order of sorting in the given query? SELECT emp_id, emp_name	1

	FROM person ORDER BY emp_id, emp_name (a) Firstly on emp_id and then on emp_name (b) Firstly on emp_name and then on emp_id (c) Firstly on emp_id but not on emp_name (d) None of the mentioned	1
12.	The practice of taking someone else's work or ideas and passing them off as one's own is known as	1
13.	Write a small python code to del a column from dataframe labeled as "xyz".	1
14.	Name the primary law in India dealing with cybercrime and electronic commerce.	1

15.	Which of the following is not an intellectual property?
	
	    a. A poem written by a poet
	    b. An original painting made by a painter
	    c. Trademark of a Company
	    d. A remixed song
		1

16.	VIRUS stands for _____ A. Very Intelligent Result Until Source B. Very Interchanged Resource Under Search C. Vital Information Resource Under Sledge D. Viral Important Record User Searched	1
17.	What do you understand by 'Intellectual Property Rights'?	1
18.	The____ command can be used to makes changes in the columns of a table in SQL.	1
19.	NULL value means : (i) 0 value (ii) 1 value (iii) None value (iv) None of the above	1
20.	Firewalls are used to protect against _____. A. data driven attacks	1

	B. fire attacks
	C. virus attacks
	D. unauthorized access
21.	_____ are group of people habitually looking to steal identifies or information, such as social security information, credit card numbers, all for monetary objectives.
	A. Spammers
	B. Phishers
	C. Spyware
	D. Spam ware

Section -II

Both the case study based questions (22 & 23) are compulsory. Attempt any four sub parts from each question. Each sub question carries 1 mark.

22. Given the two DataFrames df1 and df2 as given below and answer any four questions from (i)- (v):

df1

	First	Second	Third
0	10	4	30
1	20	5	40
2	30	7	50
3	40	9	70

df2

	First	Second	Third
0	17	14	13
1	18	15	14
2	19	17	15
3	20	19	17

Write the commands to do the following on the dataframe:

(i) To add dataframes df1 and df2.

(ii) To sort df1 by Second column in descending order.

(iii) To change the index of df2 from 0,1,2,3 to a,b,c,d

(iv) To display those rows in df1 where value of third column is more than 45.

(v) Which of the following command will display the column labels of the DataFrame?

a. print(df.columns())
b. print(df.column())
c. print(df.column)
d. print(df.columns)

23.	Consider the table STUDENT given below:	

Table BOOK_INFORMATION

Column Name
BOOK_ID
BOOK_TITLE
PRICE

Table SALES

Column Name
STORE_ID
SALES_DATE
SALES_AMOUNT

Table EXAM_RESULTS

STU_ID	FNAME	LNAME	EXAM_ID	EXAM_SCORE
10	LAURA	LYNCH	1	90
10	LAURA	LYNCH	2	85
11	GRACE	BROWN	1	78
11	GRACE	BROWN	2	72
12	JAY	JACKSON	1	95
12	JAY	JACKSON	2	92
13	WILLIAM	BISHOP	1	70
13	WILLIAM	BISHOP	2	100
14	CHARLES	PRADA	2	85

(i)	Which SQL statement allows you to find the highest price from the table BOOK_INFORMATION? (a) SELECT BOOK_ID, BOOK_TITLE, MAX(PRICE) FROM BOOK_INFORMATION; (b) SELECT MAX(PRICE) FROM BOOK_INFORMATION; (c) SELECT MAXIMUM(PRICE) FROM BOOK_INFORMATION; (d) SELECT PRICE FROM BOOK_INFORMATION ORDER BY PRICE DESC;	1
(ii)	Which SQL statement lets you find the sales amount for each store? (a) SELECT STORE_ID, SUM(SALES_AMOUNT) FROM SALES; (b) SELECT STORE_ID, SUM(SALES_AMOUNT) FROM SALES ORDER BY STORE_ID; (C) SELECT STORE_ID, SUM(SALES_AMOUNT) FROM SALES GROUP BY STORE_ID; (D) SELECT STORE_ID, SUM(SALES_AMOUNT) FROM SALES HAVING UNIQUE STORE_ID;	1
(iii)	Which statement lets you find the total number of stores in the SALES table? (a) SELECT COUNT(STORE_ID) FROM SALES; (b) SELECT COUNT(DISTINCT STORE_ID) FROM SALES; (c) SELECT DISTINCT STORE_ID FROM SALES; (d) SELECT COUNT(STORE_ID) FROM SALES GROUP BY STORE_ID;	1
(iv)	What SQL statement do we use to print out the record of all students whose last name starts with 'L'? (a) SELECT * FROM EXAM_RESULTS WHERE LNAME LIKE 'L%'; (b) SELECT * FROM EXAM_RESULTS WHERE LNAME LIKE 'L'; (c) SELECT * FROM EXAM_RESULTS WHERE LNAME = 'L'; (d) SELECT * FROM EXAM_RESULTS WHERE LNAME <> 'L';	1
(v)	What SQL statement do we use to find the average exam score for EXAM_ID = 1? (a) SELECT AVG(EXAM_SCORE) FROM EXAM_RESULTS; (b) SELECT AVG(EXAM_SCORE) FROM EXAM_RESULTS GROUP BY EXAM_ID WHERE EXAM_ID = 1; (c) SELECT AVG(EXAM_SCORE) FROM EXAM_RESULTS GROUP BY EXAM_ID HAVING EXAM_ID = 1; (d) SELECT COUNT(EXAM_SCORE) FROM EXAM_RESULTS WHERE EXAM_ID = 1	1

Part - B

	Section – I	
24.	Write a Pandas program to convert a NumPy array to a Pandas series.	2
25.	Tony has recently started working in MySQL. Help him in understanding the difference between the following : (i) Where and having clause (ii) Count(column_name) and count(*) **OR** What is the difference between the order by and group by clause when used along with the select statement? Explain with an example.	2

26.	Write the output of following MYSQL queries:
	
	   (i) SELECT ROUND(6.5675,2);
	
	   (ii) SELECT TRUNCATE(5.3456,2);
	
	   (iii) SELECT DAYOFMONTH(curdate());
	
	   (iv) SELECT MID('PRE_BOARD CLASSS 12',4,6);
		2

27.	Write a Pandas program to rename columns of a given Data Frame.
	
	Sample data:
	Original DataFrame
	     col1 col2 col3
	0 1 4 7
	1 2 5 8
	2 3 6 9
	New DataFrame after renaming columns:
	    Column1 Column2 Column3
	0 1 4 7
	1 2 5 8
	2 3 6 9
		2

28.	(i) There is column salary in table employee. The following two statements are giving different outputs. What may be the possible reasons? Select count(*) from employee; select count(salary) from employee; (ii) Mr. Sanghi created two tables with City as Primary Key in Table1 and Foreign key in Table2 while inserting row in Table2 Mr. Sanghi is not able to enter value in the column City. What is the possible reason for it?	2
29.	In a database there are two tables 'LOAN' and 'BORROWER' as shown below: LOAN 	Loan_Number	Branch_name	Amount
L-170	Downtown	3000		2

L-230   RedWood   4000

BORROWER

Customer_Name	Loan_number
Jones	L-170
Smith	L-230
Hayes	L-155

   (i)   Write Degree and Cardinality of LOAN table.
   (ii)   Identify the Primary Key column in the LOAN table.

OR

Consider the following hospital table

No	Name	Age	Department	Dateofadmin	Charge	Sex
1	Arpit	62	Surgery	21/01/06	300	M
2	Zayana	18	ENT	12/12/05	250	F
3	Kareem	68	Orthopedic	19/02/06	450	M
4	Abhilash	26	Surgery	24/11/06	300	M
5	Dhanya	24	ENT	20/10/06	350	F
6	Siju	23	Cardiology	10/10/06	800	M
7	Ankita	16	ENT	13/04/06	100	F
8	Divya	20	Cardiology	10/11/06	500	F
9	Nidhin	25	Orthopedic	12/05/06	700	M
10	Hari	28	Surgery	19/03/06	450	M

Write the sql query for
(i)To reduce Rs. 200/- from the charge of female patients who are in Cardiology department.

(ii) To insert a new row in the above table with the following data :
11, 'Rakesh', 45, 'ENT', {08/08/08}, 1200, 'M'

30.	Consider the following DataFrame of automobile	2

index	company	body-style	wheel-base	num-of-cylinders	price
0	bmw	sedan	101.2	four	16925
1	bmw	sedan	101.2	six	20970
2	honda	sedan	96.5	four	12945
3	honda	sedan	96.5	four	10345

	4	toyota	hatchback	95.7	four	5348		
	5	toyota	hatchback	95.7	four	6338		

(i) From the given data set print first and last five rows
(ii) Find the most expensive car company name

|		

31.	Expand the following terms related to Computer Networks:
	
	  a. Wi-Fi
	  b. IDLE
	  c. TCP/IP
	  d. VoIP
		2

32.	"Privacy is the protection of personal information given online. In e-commerce especially, it is related to a company's policies on the use of user data." (a) Why is the above given statement important? (b) What is the need to safeguard user privacy?	2
33.	Neelam has recently shifted to new city and new College. She does not many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile, college site's forum etc. She is also getting repeated mails from unknown people. Every time she goes online, she finds someone chasing her online. a) What is this happening to Neelam? b) What action should she taken to stop them?	2
	Section -II	
34.	Write a NumPy program to compute sum of all elements, sum of each column and sum of each row of a given row. Input: [[0 1] [2 3]] Sum of all elements: 6 Sum of each column : [2 4] Sum of each row : [1 5]	3
35.	Explain the role of online social media campaigns, crowdsourcing and smart mobs in	3

society.

OR

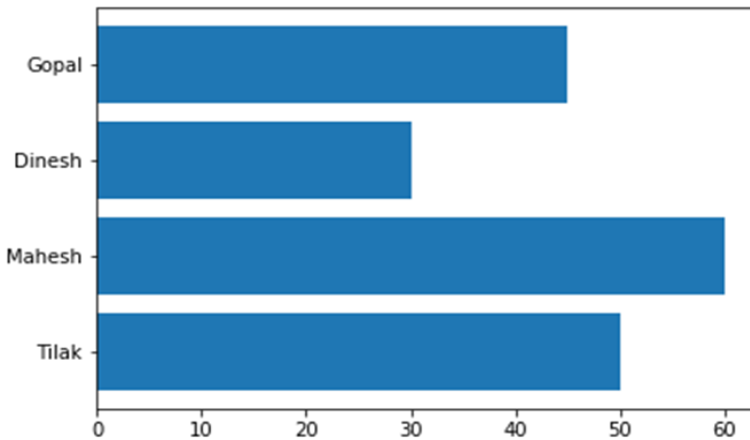What is net Neutrality? Do India Net Neutrality by law?

| 36. | Write the code to plot the following figure in python | 3 |
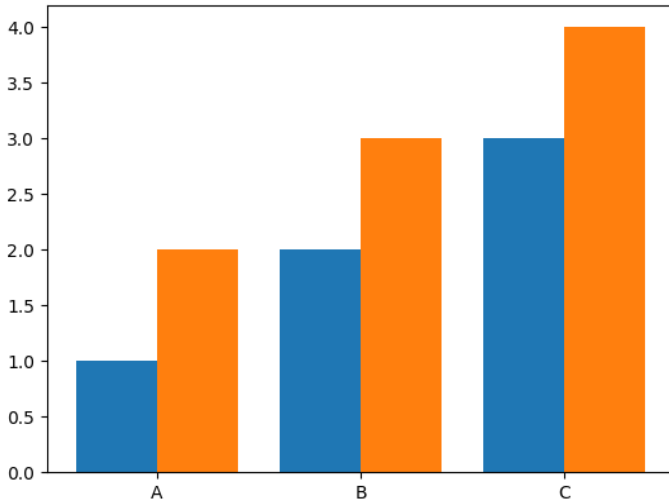
OR

Write a code to plot the bar chart as shown in the figure given below:

| 37. | TABLE: GRADUATE | | | | | | 3 |

S.NO	NAME	STIPEND	SUBJECT	AVERAGE	DIV.
1	KARAN	400	PHYSICS	68	I
2	DIWAKAR	450	COMP. Sc.	68	I
3	DIVYA	300	CHEMISTRY	62	I
4	REKHA	350	PHYSICS	63	I
5	ARJUN	500	MATHS	70	I
6	SABINA	400	CEHMISTRY	55	II
7	JOHN	250	PHYSICS	64	I
8	ROBERT	450	MATHS	68	I

| 9 | RUBINA | 500 | COMP. Sc. | 62 | I |
| 10 | VIKAS | 400 | MATHS | 57 | II |

(a)   List the names of those students who have obtained DIV I sorted by NAME.

(b)   Display a report, listing NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.

(c.)   To count the number of students who are either PHYSICS or COMPUTER SC graduates.

Section -III

38. Assume following data is stored in data frame named as df1. Write following commands:

Name of Employee	Sales	Quarter	State
RSahay	125600	1	Delhi
George	235600	1	Tamil Naidu
JayaPriya	213400	1	Kerala
ManilaSahai	189000	1	Haryana
RymaSen	456000	1	West Bengal
ManilaSahai	172000	2	Haryana
JayaPriya	201400	2	Kerala

Perform the following operations on the DataFrame :

(i)Find total sales per state
(ii) find total sales per employee
(iii)find total sales both employee wise and state wise
(iv)find mean, median and min sale state wise
(v)find maximum sale by individual

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39. Write the SQL functions which will perform the following operations:

i) To display the name of the month of the current date.
ii) To remove spaces from the beginning and end of a string, "   Panorama   ".
iii) To display the name of the day e.g., Friday or Sunday from your date of birth,

5

dob.

iv) To display the starting position of your first name (fname) from your whole name (name).

v) To compute the remainder of division between two numbers, n1 and n2

OR

Consider the following tables Consignor and Consignee. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (vi).

TABLE:CONSIGNOR

CnorID	CnorName	CnorAddress	City
ND01	R Singhal	24,ABC Enclave	New Delhi
ND02	Amit Kumar	123, Palm Avenue	New Delhi
MU15	R Kohli	5/A, South Street	Mumbai
MU50	S Kaur	27-K, Westend	Mumbai

TABLE:CONSIGNEE

CneeID	CnorID	CneeName	CneeAddress	City
MU05	ND01	Rahul Kishore	5,Park Avenue	Mumbai
ND08	ND02	P Dhingra	16/J, Moore Enclave	New Delhi
KO19	MU15	A P Roy	2A, Central Avenue	Kolkata
MU32	ND02	S Mittal	P 245, AB Colony	Mumbai
ND48	MU50	B P Jain	13, Block D, A Vihar	New Delhi

(i) To display the names of all Consignors fromMumbai.

(ii) To display the CneeID, CnorName, Cnoraddress, CneeName, CneeAddress for every Consignee.

(iii) To display Consignee details in ascending order of CneeName.

(iv) To display numbers of Consignors from each city.

(v) SELECT DISTINCT City FROM Consignee;

(vi) SELECT A.CnorName, B.CneeName
   FROM Consignor A, Consignee B
    WHERE A.CnorID=B.CnorID AND B.CneeCity= 'Mumbai';

40. Uplifting Skills Hub India is a knowledge and skill community which has an aim to uplift the standard of knowledge and skills in the society. It is planning to setup its training centers in multiple towns and villages pan India with its head offices in the nearest cities. They have created a model of their network with a city, a town and 3 villages as follows.

As a network consultant, you have to suggest the best network related solutions for their issues/problems raised in (i) to (iv) keeping in mind the distances between various locations and other given parameters.

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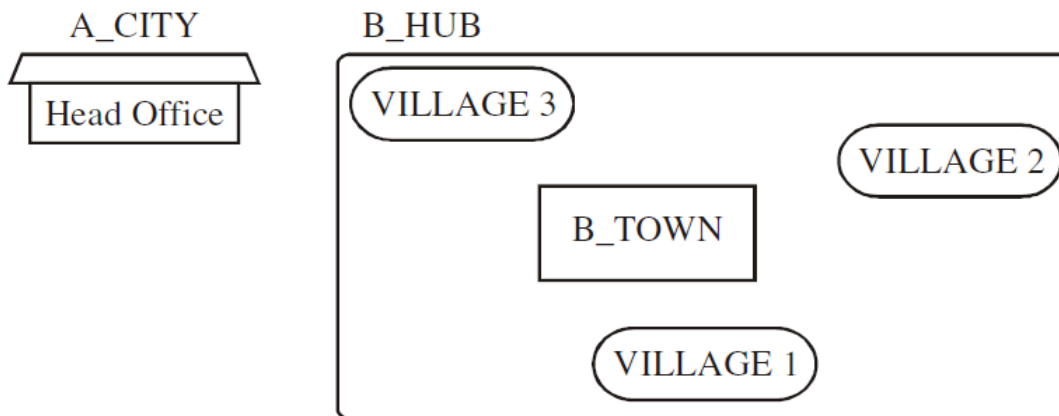
Shortest distances between various locations :
VILLAGE 1 to B_TOWN 2 KM
VILLAGE 2 to B_TOWN 1.0 KM
VILLAGE 3 to B_TOWN 1.5 KM
VILLAGE 1 to VILLAGE 2 3.5 KM
VILLAGE 1 to VILLAGE 3 4.5 KM
VILLAGE 2 to VILLAGE 3 2.5 KM
A_CITY Head Office to B_HUB 25 KM

Number of Computers installed at various locations are as follows :
B_TOWN 120
VILLAGE 1 15
VILLAGE 2 10
VLLAGE 3 15
A_CITY OFFICE 6

Note :
→In Villages, there are community centers, in which one room has been given as training center to this organization to install computers.
→The organization has got financial support from the government and top IT companies.

(i) Suggest the most appropriate location of the SERVER in the B_HUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer.

(ii) Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the B_HUB.

(iii) Which hardware device will you suggest to connect all the computers within each location of B_HUB?

(iv) Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at all locations of B_HUB?

(v) Which topology is best suitable for the network?

-----------------------Best of Luck----------------------